

REMARKS

This paper is responsive to an Office Action dated June 11, 2003. Prior to this amendment claims 1-8 and 18-29 were pending. After canceling claims 2, 3, 19, 20, and 25, and amending claims 1, 8, 18, 22, and 24, claims 1, 4-8, 18, 21-24, and 26-29 remain pending.

In Section 3, the Office Action objects to the title as being not descriptive. In response the title has been amended.

Section 5 of the Office Action states that claims 24 and 26-28 have been rejected under 35 U.S.C. 102(b) as being anticipated by the applicant's admitted prior art (AAPA). With respect to claims 24 and 26, the Office Action states that the AAPA discloses (pages 5-7, Fig. 1a) a method comprising:

forming a first conductive layer (Mo); and

forming a metal layer (Al) overlying the first conductive layer.

With respect to claim 27, the Office Action states that the AAPA discloses an Al thickness of greater than 1000 Å. With respect to claim 28, the Office Action states that the AAPA discloses that the metal layer is an LCD reflector.

In response, claim 24 has been amended to include the subject matter of claim 25, which is not described in the AAPA. Since the AAPA does not describe all the limitations of the invention of claim 24, it cannot anticipate. Claims 26-28, dependent from claim 24, also enjoy the same distinctions from the cited prior art, and the Applicant requests that the rejection be removed.

Claims 25 and 29 have been rejected as unpatentable over the AAPA under 35 U.S.C. 103(a). The Office Action acknowledges that the AAPA does not disclose a first electrically conductive layer of Ti, Ta, or Al. The Office Action states that it was commonly known that Ti has a better etch resistance than Mo, and it would have been obvious to one of ordinary skill at the time to substitute Mo for Ti. This rejection is traversed as follows.

An invention is unpatentable if the differences between it and the prior art would have been obvious at the time of the invention. As stated in MPEP § 2143, there are three requirements to establish a *prima facie* case of obviousness.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaack* 947 F.2d 488, 20 USPQ2d, 1438 (Fed. Cir. 1991).

In accordance with the above-stated first *prima facie* requirement, the references themselves must suggest a reason to either modify a reference, or the knowledge generally must provide a motivation to modify the reference in such a way as to make the claimed invention obvious. In this case, the Office Action states that it was well known that Ti has a better etch rate than Mo, and that it would have been obvious to substitute materials. However, the fact that the etch rates are known is not a proof of motivation. That is, there is nothing in the Office Action to

support the conclusion that a skilled artisan could find a suggestion to fabricate the ozone resistant structure of claim 24, just from knowing the etch rates of various materials.

Thus when they (the Patent Examiner and the Board) rely on what they assert to be general knowledge to negate patentability, that knowledge must be articulated and placed on the record. The failure to do so is not consistent with effective administrative procedure or effective judicial review. The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies. *In re Sang-Su Lee*, 277 F.3d 1338 (Fed. Cir 2002), 61 USPQ2d 1430.

Alternately stated, it is not enough to say that it would have been within the level of an artisan's skill to substitute materials in the fabrication of a reflector or electrode. Likewise, the fact that a modification would be within the ordinary skill of the art is not proof of motivation *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). The Office Action must provide a rationale to support the position a person of ordinary skill would have created the claimed invention structure from just a knowledge of the etch rates. The claimed invention resulted from the realization that ozone cleaning was damaging the conventional Al/Mo structures in response to the differential etch rates, and the simultaneous understandings that the Mo material could be substituted, and the substituted material could have a higher etch resistance than the overlying electrode layer (Al). A knowledge of etch rates merely supports such an analysis.

Further, the Examiner has not demonstrated that the modification of the cited prior art reference points to the reasonable

expectation of success in the present invention, which is the second requirement of the obviousness analysis.

The third requirement to support a *prima facie* case of obviousness requires that the combination of references disclose all the elements of the claimed invention. The AAPA only describes a first conductive layer of Mo. The AAPA does not describe Ti, Ta, or Al first conductive layer elements of claim 24 (as amended). Claims 25 and 25, dependent from claim 24, also benefit from the above-mentioned distinctions. Since the AAPA neither suggests, nor recites all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

In Section 11 of the Office Action claims 1-8 and 18-23 have been rejected as unpatentable under 35 U.S.C. 103(a) with respect to the AAPA in view of US Patent 5,808,315 (Murakami et al.; "Murakami"). The Office Action states that the AAPA depicts an LCD reflector structure having a first conductive ITO layer; a barrier layer, such as Mo, overlying the ITO, and a metal layer, such as Al, overlying the barrier layer (pages 5-7 and Fig. 1a). The Office Action acknowledges that the AAPA does not disclose a barrier layer material such as Ti, Ta, TiN, TaN, Al, Al compounds, tungsten, chrome, or copper. The Office Action further states that Murakami discloses a structure of ITO; chromium and TiN; and, Al, where the chromium and TiN advantageously provides a good contact with the ITO. The Office Action states that Murakami is evidence that an ordinary artisan in the field would find a suggestion or motivation to use an ozone resistant layer such as TiN or chromium. Therefore, the Office Action concludes that it would have been obvious to one of ordinary skill at the time of the invention to modify the reflector of the AAPA by

substituting chromium or TiN materials, for Mo, to provide a good contact with ITO. This rejection is traversed as follows.

In one embodiment, Murakami discloses an interconnect structure consisting of an ITO pixel 13, a layer of chromium or TiN 16 overlying the ITO, and an electrode 15 overlying the chromium layer (col. 7, ln 29 through col. 8, ln. 56; especially col. 8, ln. 43-56 and Fig. 9d). Murakami states that chromium (or TiN) is used to improve contact to the ITO.

In the interest of clearly distinguishing the claimed invention, claims 1, 8, 18, and 22 have been amended to specifically recite ITO as the first conductive layer, and to recite a specific group of ozone resistant barrier materials. Further, the claims have been to remove the recitation of chrome and TiN as ozone resistant barrier materials.

To make a case that there is motivation for the combination of the AAPA and Murakami in a way that makes the claimed invention obvious, a rationale must be presented for why a process that uses a material (chromium or TiN) to improve contact with an underlying ITO layer, suggests the use of the same materials as an ozone resistant barrier. Alternately stated, the Murakami reference makes no correlation between ozone resistance and the chromium and TiN materials. Said yet another way, it is not necessarily relevant that Murakami has a motive to use chromium/TiN. Rather, Murakami must have a motivation to use chromium/TiN in a manner that suggests the claimed invention, namely, to provide a barrier to ozone. Likewise, the Office Action provides no support for why a person of ordinary skill at the time of the invention would have motivated to modify the cited prior art in such a way as to describe the claimed invention structure. This is especially true as ozone

cleaning was a relatively new process in LCD fabrication, and not all the problems associated with the use of ozone may have been understood as general knowledge at the time of the invention.

Again, the Office Action has not demonstrated that the modification of the combined prior art reference points to the reasonable expectation of success in the present invention, which is the second requirement of the obviousness analysis.

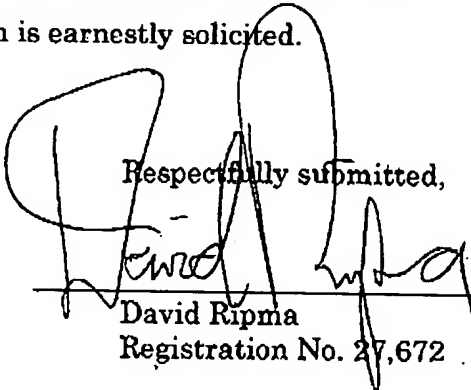
The third requirement to support a *prima facie* case of obviousness requires that the combined references disclose all the elements of the claimed invention. Generally, neither of the references describes the use of an ozone resistant material between the ITO and top metal layer (Al). Murakami only mentions materials that support a good contact to ITO. More specifically, the combination of references does not mention the recited ozone barrier materials of Ti, Ta TaN, Al, Al compounds, tungsten, or copper. All claims dependent from claims 1 and 18 benefit from the above-mentioned distinctions from the cited prior art. With respect to claim 23, a structure comprising a first electrically conductive layer of Ti, Ta, or Al, and an overlying reflective metal layer of Al is recited. Neither the AAPA nor Murakami explicitly describe or suggest such a structure. Since the cited prior art neither suggests, nor contains all the elements of the claimed invention, the Examiner is requested to withdraw the rejection.

It is believed that the application is in condition for allowance and reconsideration is earnestly solicited.

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Respectfully submitted,



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